

Code No: R1632041

**R16****SET - 1****III B. Tech II Semester Regular Examinations, April/May - 2019**  
**MICROPROCESSORS AND MICROCONTROLLERS****(Common to Electronics and Communication Engineering, Electronics and Instrumentation Engineering, Electronics and Computer Engineering)**

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answer **ALL** the question in **Part-A**3. Answer any **FOUR** Questions from **Part-B**

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**PART -A**

1. a) Differentiate between minimum and maximum mode operations of 8086 microprocessor. [2M]
- b) What is immediate addressing mode of 8086? Explain with an example instruction. [2M]
- c) List the applications of A/D and D/A converters. [2M]
- d) List the salient features of 80386DX microprocessor. [3M]
- e) Differentiate between microprocessors and microcontrollers. [3M]
- f) What is a Timer? What is its use? [2M]

**PART -B**

2. a) What are registers? List and discuss the functions of the registers of 8086 microprocessor. [9M]
- b) What is an interrupt? List and explain different interrupts supported by 8086 microprocessor. [5M]
3. a) Write and discuss different machine language instruction formats supported by 8086 microprocessor. [9M]
- b) Write an assembly language program in 8086 to find the factorial of a given number. [5M]
4. a) Explain the BSR mode of operation of 8255 programmable peripheral interface. [6M]
- b) Write an assembly language program in 8086 to generate a symmetrical square wave with 1KHz frequency? Give the necessary circuit set up with a DAC. [8M]
5. a) Explain the use of segment descriptor register and control registers of 80386. [7M]
- b) List and discuss different data types supported by 80386 microprocessor. [7M]
6. a) Discuss the internal memory organization of 8051 microcontroller. [7M]
- b) List and explain various addressing modes of 8051 microcontroller. [7M]
7. a) How microcontrollers can be used for automation and control applications? Explain. [6M]
- b) Discuss the additional features and applications of PIC 16F877 Microcontrollers. [8M]

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Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answer **ALL** the question in **Part-A**3. Answer any **FOUR** Questions from **Part-B**

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**PART -A**

1. a) What is the use of memory segmentation in 8086 microprocessor? [2M]
- b) What is the use of LOCK prefix in 8086 programming? [2M]
- c) Differentiate between static memory and dynamic memory. [2M]
- d) What is Paging? Explain its use. [3M]
- e) What is a seven segment display? Briefly explain its implementation. [3M]
- f) What are the advantages of PIC microcontrollers? [2M]

**PART -B**

2. a) List the main features of 8086 microprocessor. Draw and explain the internal architecture of 8086 microprocessor. [10M]
- b) Draw the flag register of 8086 and discuss the use of each flag. [4M]
3. a) What are addressing modes? List different addressing modes supported by 8086 and explain with suitable examples. [10M]
- b) What is the purpose of AAA, AAD and DAA instructions of 8086? Explain with examples. [4M]
4. a) Interface an 8255 with 8086 to work as a peripheral interface. Initialize its port A as output port, port B as input port and port C as output port. Port A address should be 0740H. Write a program to sense switch positions SW<sub>0</sub> –SW<sub>7</sub> connected at port B. The sensed pattern is to be displayed in port A, to which 8 LEDs are connected, which the port C lower displays number of 'ON' switches out of the total eight switches. [12M]
- b) What is DMA? What are its advantages? [2M]
5. a) Draw and discuss the register set of 80386 and explain the functions of registers in brief. [11M]
- b) Enlist the additional features of 80486 over 80386 microprocessor. [3M]
6. a) What are Timers? Explain the timers of 8051 microcontroller. Also explain the use of TMOD register. [8M]
- b) What are interrupts? What are various interrupts supported by 8051 microcontroller? Specify the priority of these interrupts. [6M]
7. a) What is the use of File Selection Register (FSR) in PIC microcontrollers? [7M]
- b) Discuss the salient features of PIC microcontrollers. [7M]

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)

2. Answer **ALL** the question in **Part-A**

3. Answer any **FOUR** Questions from **Part-B**

**PART –A**

1. a) List and explain the machine control flags of 8086 microprocessor. [2M]
- b) Explain PUSH and POP instructions with examples. [2M]
- c) What is the use of BSR mode of operation of 8255? [2M]
- d) What Cache memory? What is its use? [3M]
- e) Differentiate between serial communication and parallel communication. [3M]
- f) List the applications of PIC microcontrollers. [2M]

**PART -B**

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|----|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 2. | a) | What is memory segmentation? What is its use? Explain the memory segmentation in 8086 microprocessor.                                                                                                                                                                             | [9M]  |
|    | b) | What is the use of operating 8086 in maximum mode? Explain.                                                                                                                                                                                                                       | [5M]  |
| 3. | a) | List different arithmetic instruction of 8086 microprocessor and explain with examples.                                                                                                                                                                                           | [7M]  |
|    | b) | Write a program in 8086 to convert a 16-bit binary number into equivalent BCD number.                                                                                                                                                                                             | [7M]  |
| 4. | a) | Discuss the applications of A-to-D and D-to-A converters.                                                                                                                                                                                                                         | [4M]  |
|    | b) | Draw the schematic diagram of stepper motor interfacing to 8086. Write an assembly language program to rotate shaft of a 4-phase, 200 teeth stepper motor<br>i) 10 rotations in clockwise ii) 5 rotations in anticlockwise<br>iii) Exactly by an angle of $27^\circ$ in clockwise | [10M] |
| 5. | a) | Explain the physical address formation in real address mode of 80386 microprocessor.                                                                                                                                                                                              | [8M]  |
|    | b) | What is meant by paging? What are its advantages and disadvantages?                                                                                                                                                                                                               | [6M]  |
| 6. | a) | What are various addressing modes supported by 8051? Discuss with example instructions.                                                                                                                                                                                           | [9M]  |
|    | b) | Explain the I/O ports of 8051 microcontroller.                                                                                                                                                                                                                                    | [5M]  |
| 7. | a) | Discuss the characteristics of PIC microcontrollers.                                                                                                                                                                                                                              | [7M]  |
|    | b) | Discuss the memory organization of PIC 16F877 microcontroller.                                                                                                                                                                                                                    | [7M]  |

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**R16****SET - 4****III B. Tech II Semester Regular Examinations, April/May - 2019**  
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Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answer **ALL** the question in **Part-A**3. Answer any **FOUR** Questions from **Part-B**

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**PART -A**

1. a) Explain the functions of ALE, READY, HOLD, and BHE pins of 8086 microprocessor. [2M]
- b) Discuss the use of EQU, OFFSET, ENDP and LENGTH assembler directives. [2M]
- c) Differentiate between LEDs and LCDs. [2M]
- d) What is virtual memory? [3M]
- e) What are the additional features of microcontrollers over microprocessors? [3M]
- f) What is serial data communication? How is it different from parallel communication? [2M]

**PART -B**

2. a) What is an interrupt? What are different types of interrupt supported by 8086 microprocessor? [4M]
- b) With a neat schematic diagram, discuss the working of 8086 microprocessor in its maximum mode. Draw and discuss the timing diagrams for memory read and write operation. [10M]
3. a) Write an assembly language program to find out the number of positive numbers and negative numbers from a given list of 16-bit signed numbers. [7M]
- b) What are assembler directives? Explain any seven assembler directive supported by 8086. [7M]
4. a) What are the main features of 8255? Draw and explain the control word register formats of 8255. [5M]
- b) Interface ADC 0808 with 8086 using 8255 ports. Use port A of 8255 for transferring digital data output of ADC to the CPU and port C for control signals. Assume that an analog input is present at I/P2 of the ADC and a clock input of suitable frequency is available for ADC. Draw the schematic and write required ALP. [9M]
5. a) Draw and discuss the paging mechanism of 80386 in detail. [7M]
- b) What is meant by a cache memory? How does it speed up the program execution? Explain. [7M]
6. a) With a neat diagram, explain the internal architecture of 8051 microcontroller. [10M]
- b) List and discuss the applications of 8051 microcontrollers. [4M]
7. a) What is the use of interrupts? Discuss the interrupts in PIC 16F877. [6M]
- b) List and discuss the main instructions of the PIC 16F877. [8M]

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